

## CLAIMS

1. A sensing apparatus comprising:
  - a transmission line for propagating an electromagnetic wave therethrough; and
    - a detection means for detecting propagation state of the electromagnetic wave at an arbitrary location on the transmission line,
      - wherein an interaction between an object disposed in the vicinity of the transmission line and the electromagnetic wave is detected.
  2. The sensing apparatus according to claim 1, further comprising an electromagnetic wave generating means.
  - 15 3. The sensing apparatus according to claim 2, wherein the transmission line and the electromagnetic wave generating means are disposed on a same substrate.
  4. The sensing apparatus according to claim 2,
    - 20 wherein the electromagnetic wave generating means is of a current-injection type.
  5. The sensing apparatus according to claim 1,
    - wherein the detection means comprises a thin-line-shaped probe.
  - 25 6. The sensing apparatus according to claim 1,
    - wherein the detection means comprises a probe with a tip of a diameter which is not more than 1/10 of a

wavelength of a propagating electromagnetic wave.

7. The sensing apparatus according to claim 1,  
wherein the detection means detects the propagation  
state on the transmission line at a plurality of  
5 locations.

8. The sensing apparatus according to claim 7,  
wherein the detection means detects the propagation  
state of the electromagnetic wave at the plurality of  
locations by changing a relative positional  
10 relationship between the detection means and the  
transmission line by scanning.

9. The sensing apparatus according to claim 7,  
wherein the detection means that detects the  
propagation state of the electromagnetic wave at the  
15 plurality of locations comprises an electrooptic  
crystal.

10. The sensing apparatus according to claim 1,  
wherein the transmission line is provided with a  
resonance structure for confining a propagating  
20 electromagnetic wave.

11. A sensing apparatus according to claim 1,  
wherein the electromagnetic wave has a frequency  
within the range of 30 GHz to 30 THz.

12. A sensing apparatus comprising:  
25 a transmission line for propagating an  
electromagnetic wave therethrough;  
a detection means for detecting propagation

state of the electromagnetic wave through the transmission line; and

5       a flow path disposed in the vicinity of the transmission line, for allowing an object to move therein,

          wherein an interaction between the object and the electromagnetic wave is detected.

13. The sensing apparatus according to claim 12,  
wherein the detection means is provided at a  
10      plurality of locations.

14. The sensing apparatus according to claim 12,  
wherein the electromagnetic wave has a frequency  
within the range of 30 GHz to 30 THz.